Service Manual

74 PM-80/10B

Integrated amplifier

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marantz®

model PM-80SE

First issue : 1992

4822 725 50958 A.O

PCS 59 854

MARANTZ DESIGN AND SERVICE

Using superior design and selected high grade components, MARANTZ company has created the ultimate in stereo sound.
Only **original MARANTZ parts** can insure that your MARANTZ product will continue to perform to the specifications for which it is famous.

Parts for your MARANTZ equipment are generally available to our National Marantz Subsidiary or Agent.

MARANTZ INTERNATIONAL
Vestdijk 9
5600 MD Eindhoven
The Netherlands
Phone: +31/40.758290
Telefax: +31/40.75.82.99
Telex: 35000 PHTC NL routing IND NLMTFAT

ORDERING PARTS:

Parts can be ordered either by mail or by telex. In both cases, correct part number has to be specified.
The following information must be supplied to eliminate delays in processing your order:

1. Complete address
2. Complete part numbers and quantities required
3. Description of parts
4. Model number for which part is required
5. Way of shipment
6. Signature: any order form or telex must be signed otherwise such part order will be considered as null and void.

PARTS ORDERING

Parts may be ordered at the following addresses:

AUSTRIA
HORNYPHON
Vertriebsgesellschaft GmbH
Wienerbergstrasse 1
A 1101 Wien
Austria
Telex: 132.332

BELGIUM
SVD DIVISION MARANTZ
Industrialaan 1
1720 Groot-Bijgaarden
Belgium
Telex: 24466

CHILE
MARANTZ
DIVISION OF PHILIPS S.A.
AV. Santa Maria, 0760
Casilla 2687
Santiago
Telex: 240.239

DENMARK
MARANTZ
DIVISION OF PHILIPS
SERVICE A/S
Prags Boulevard 80
Postbox 1919
DK-2300 København S
Denmark
Telex: 31201

FINLAND
MARANTZ
DIVISION OF OY PHILIPS Ab
Kaivokatu 8
00100 Helsinki
Finland
Telex: 124811

FRANCE
MARANTZ FRANCE
4 Rue Bernard Palissy
92600 Asnières
France
Telex: 611651

GERMANY
MARANTZ GERMANY GmbH
Alexanderstrasse 1
2000 Hamburg
Germany

THE NETHERLANDS
Elpro Marantz
Wint Hontlaan 28
3526 KV Utrecht
The Netherlands
Telex: 4748

NORWAY
MARANTZ
DIVISION OF PHILIPS A/S
Sandstuveien 40
0680 Oslo 6
Norway
Telex: 72640

GREAT BRITAIN
MARANTZ AUDIO U.K. Ltd
Unit 15/16
Saxon Way Industrial Estate
Moor Lane
Harmondsworth UB7 OLW
Great Britain
Telex: 935196

GREECE
SHERTON ELECTRONICS S.A.
P.O.Box 21025
Hippocratus Street 188
Athens 11471
Greece
Telex: 216.795

JAPAN
MARANTZ JAPAN, Inc.
35-1, 7-chome, Sagamiono
Sagamihara-shi, Kanagawa
Japan

KUWAIT
AL ALAMIAH ELECTRONICS
Ussama Building
Fahd al Saleem Street
P.O.Box 23781
Safat-Kuwait
Telex: 22694

ITALY
MARANTZ ITALIANA S.P.A.
Via Chiese, 74
20126 Milano
Italy

SAUDI ARABIA
AL ALAMIAH ELECTRONICS
P.O.Box 5954
University Street
Riyadh 11432
Saudi Arabia
Telex: 401530

SOUTH AFRICA
MARANTZ
DIVISION OF PHILIPS S.A.
Main Road Martindale
P.O. Box. 58088
Newville 21114
South Africa

SPAIN
PHONO S.A.
Ignacio Iglesias 10
Badalona (Barcelona)
Spain
Telex: 59355

SWEDEN
MARANTZ
DIVISION OF PHILIPS
Försäljning AB
Tegeluddsvägen 1
S-115 84 Stockholm
Sweden
Telex: 14060

SWITZERLAND
MARANTZ
Technischer Service
Duenstrasse 3
3186 Düdingen
Switzerland

TURKEY
DOGRUOL Ltd.
I.M.C.
6 Blok N°6310
Unkapani
Istanbul
Turkey
Telex: 22085

MALTA
CACHIA & GALEA
Republic Street, 68D
Valetta
Telex: 1682

PORTUGAL
MARANTZ
Divisao philips S.A. service
Outurela-carnaxide
2795 LinDA-A-VELHA
Telex: 43906

All of the above locations are fully equipped to take care of your total service needs. Because various countries have differing configuration requirements, it is necessary that you contact the service facility in your particular country. In the event that there is no service location listed for your country, please, contact the nearest facility for the necessary assistance.

In case of difficulties, do not hesitate to contact the Technical Department at abovementioned address.

TECHNICAL SPECIFICATIONS

Power output

FTC8 Ohms (20 Hz–20 kHz) . . . . . 100/25 W (Class A)
DIN 8 Ohms/4 Ohms . . . . . 110/180 W

IHF dynamic power

8 Ohms/4 Ohms/2 Ohms . . . . . 135/220/340 W
THD at 8 Ohms RMS rated output 0.008%
Intermodulation distortion 0.008%
Damping factor 150

Magnetic cartridge input

Input sensitivity impedance . . . . . 2.5 mV/4.7 kOhm
Accuracy of frequency response to IEC RIAA . . . . . 0.5 dB
Signal to noise ratio . . . . . 86 dB

Moving coil cartridge input

Input sensitivity impedance . . . . . 250 μV/100 Ohm
Signal to noise ratio . . . . . 72 dB

Tuner/CD/Aux/Tape inputs

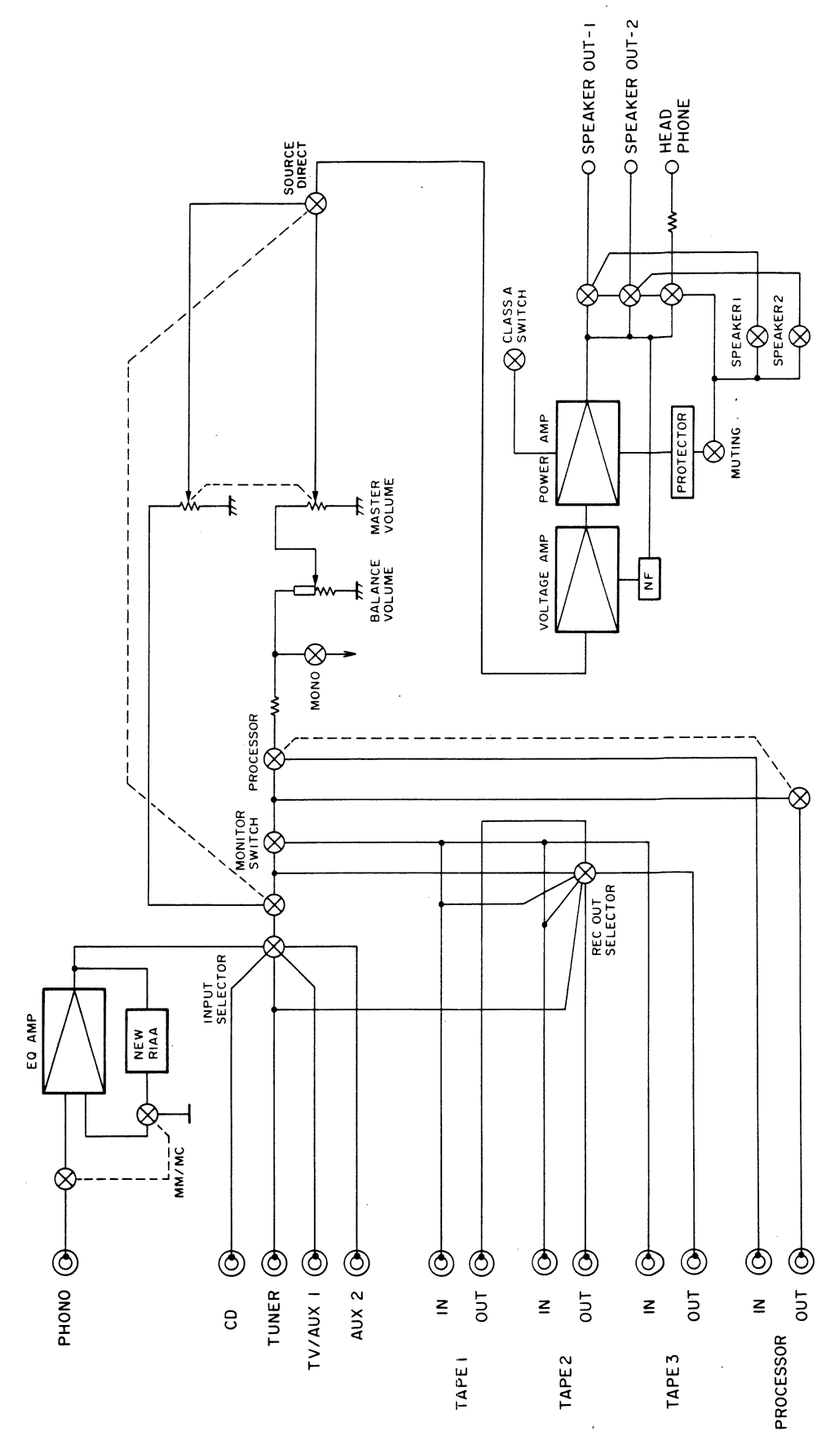
Input sensitivity impedance . . . . . 150 mV/33 kOhm
Signal to noise ratio . . . . . 96 dB
Frequency response (–3 dB limits) . . . . . 10 Hz–70 kHz
Tone characteristic (100 Hz and 10 kHz) . . . . . ±6 dB
Channel separation (1 kHz/10 kHz) . . . . . >85/>65 dB

General

Power Requirements
/10B versions . . . . . 230/240V AC, 50/60 Hz
Dimensions
Panel Width . . . . . 420 mm
Panel Height . . . . . 146 mm
Depth . . . . . 334 mm
Weight
Unit alone . . . . . 13 kg

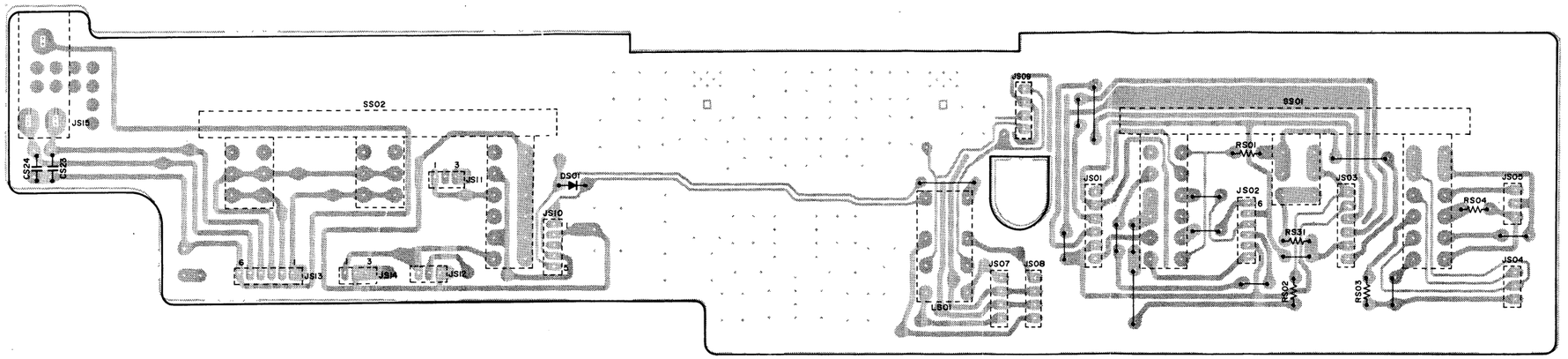
Specifications subject to change without prior notice.

1. BLOCK DIAGRAM

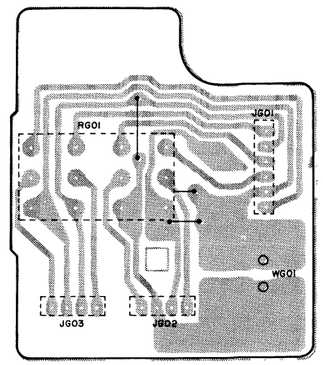


2. SCHEMATIC DIAGRAM AND PARTS LOCATION (Pattern Side)

PS01

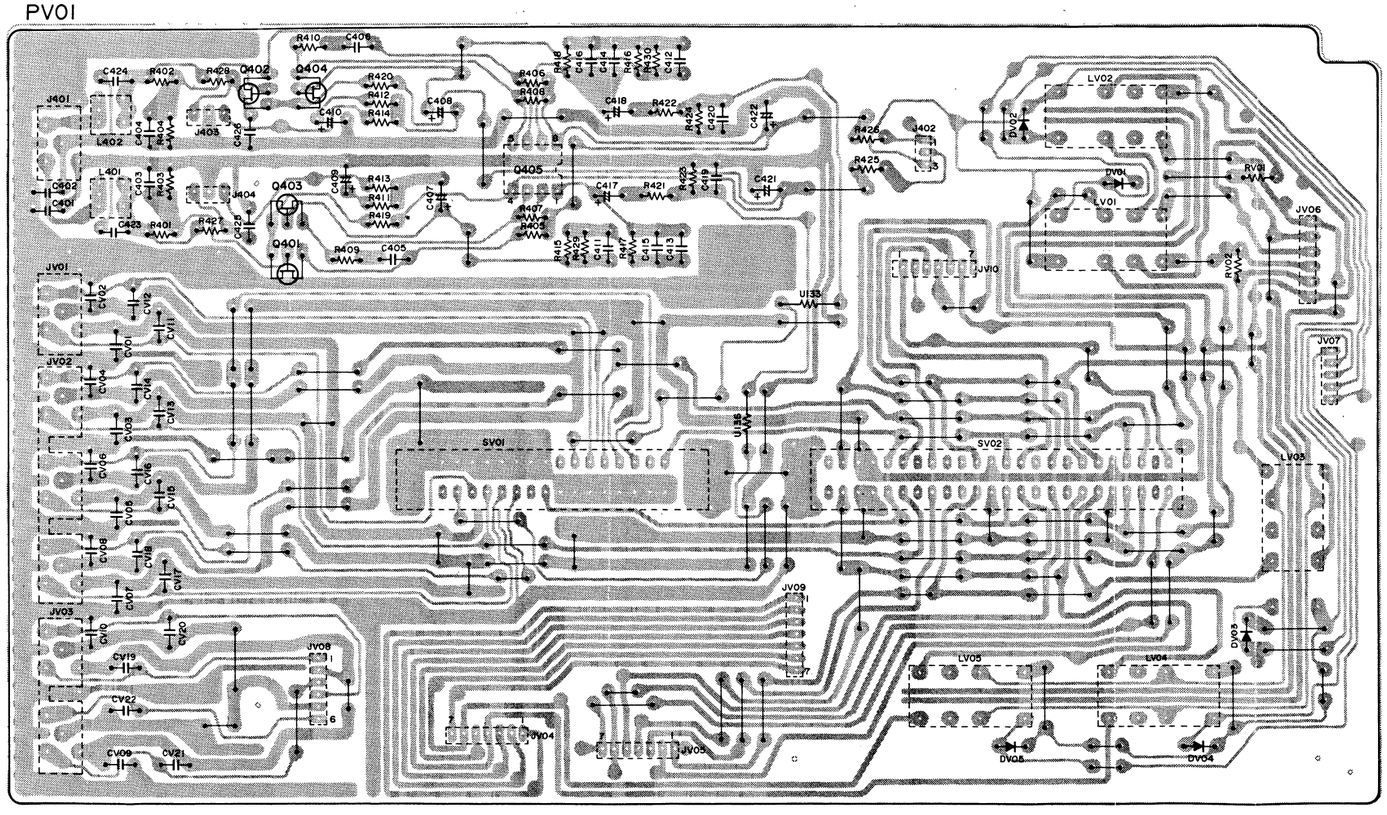


PG01

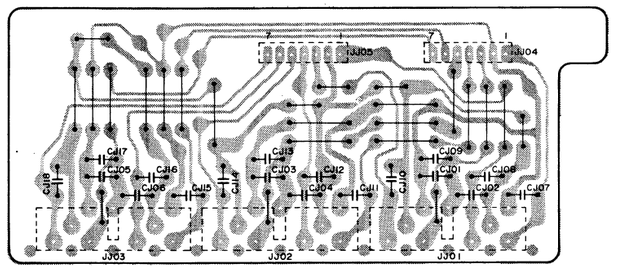


PV01

Q401~Q404 Q405

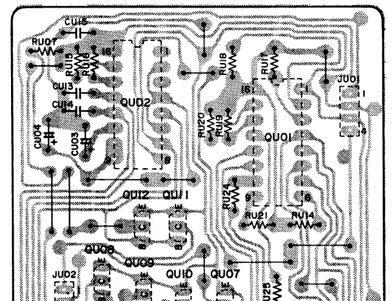


PJ01

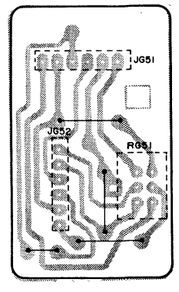


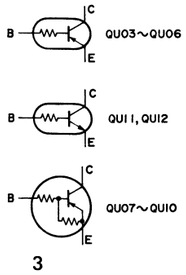
QU02 QU03~QU12 QU01

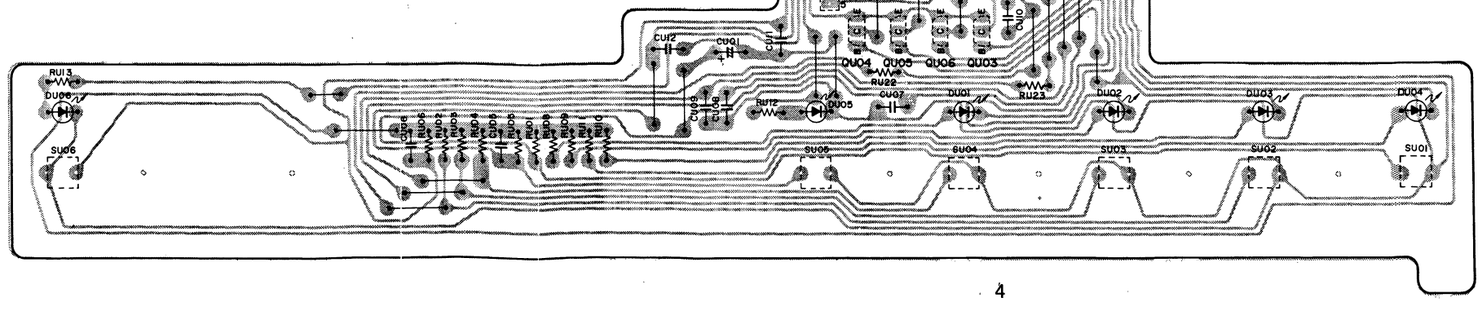
PU01

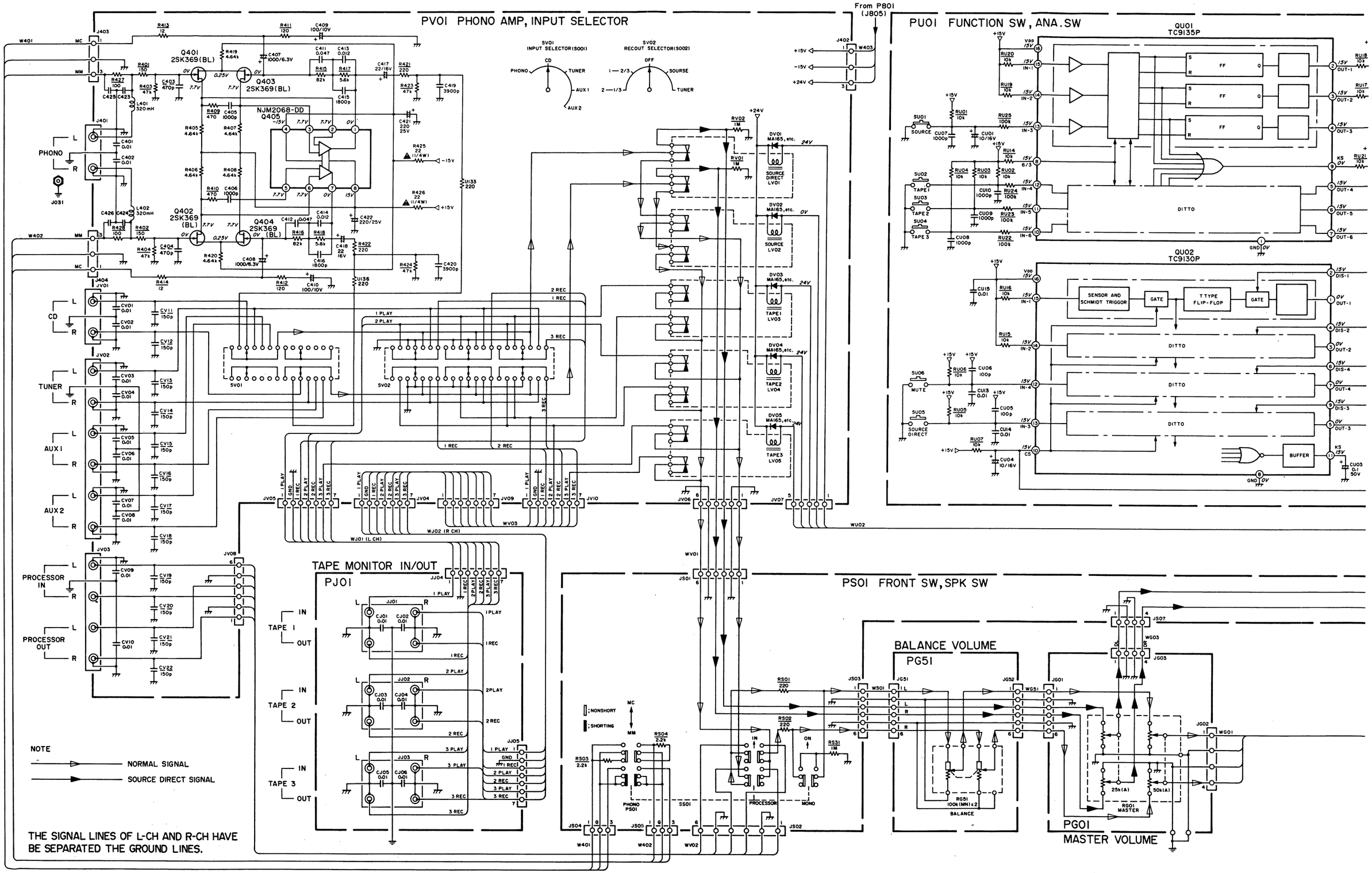


PG51








PVO1 PHONO AMP, INPUT SELECTOR
PUO1 FUNCTION SW, ANA.SW
From P801 (J805)
SV01 INPUT SELECTOR(S001)
SV02 RECOUT SELECTOR(S002)
Q401 2SK369(BL)
Q403 2SK369(BL)
Q402 2SK369 (BL)
Q404 2SK369 (BL)
NJM2068-DD Q405
QU01 TC9135P
QU02 TC9130P
DITTO
SENSOR AND SCHMIDT TRIGGOR
GATE
T TYPE FLIP-FLOP
BUFFER
TAPE MONITOR IN/OUT
PJ01
PS01 FRONT SW, SPK SW
BALANCE VOLUME
PG51
PG01
MASTER VOLUME
PHONO
CD
TUNER
AUX1
AUX2
PROCESSOR IN
PROCESSOR OUT
TAPE 1
TAPE 2
TAPE 3
SOURCE DIRECT
SOURCE
TAPE1
TAPE2
TAPE3
MUTE
BALANCE
MASTER
NOTE
NORMAL SIGNAL
SOURCE DIRECT SIGNAL
THE SIGNAL LINES OF L-CH AND R-CH HAVE BE SEPARATED THE GROUND LINES.

SELECTOR

SV02 RECOUT SELECTOR(S002)

OFF

1—2/3 SOURSE

2—1/3 TUNER

(S001)

TUNER

AUX 1

AUX 2

From P801 (J805)

J402 W403

+15V

-15V

+24V

RV02 1M

RV01 1M

DV01 MA165, etc. 24V

SOURCE DIRECT LV01

DV02 MA165, etc. 0V

SOURCE LV02

DV03 MA165, etc. 24V

TAPE1 LV03

DV04 MA165, etc. 24V

TAPE2 LV04

DV05 MA165, etc. 24V

TAPE3 LV05

JV10

JV06

JV07

WU02

WV01

JS01

PU01 FUNCTION SW, ANA.SW

QU01 TC9135P

Vdd 15V

IN-1 IN-2 IN-3 IN-4 IN-5 IN-6

OUT-1 OUT-2 OUT-3 OUT-4 OUT-5 OUT-6

S R FF Q

DITTO

GND 0V

RU20 10k RU19 10k RU25 100k RU14 10k RU04 10k RU03 10k RU02 10k RU24 100k RU23 100k RU22 100k

RU18 10k RU17 10k RU11 1.2k

RU01 10k RU21 10k

SU01 SOURCE CU07 1000p CU01 10/16V

SU02 TAPE1 SU03 TAPE2 SU04 TAPE3 CU10 1000p CU09 1000p CU08 1000p

DU04 LT3DBB RED

KS 0V

QU03~QU06 DTA114ES

QU03 QU04 QU05 QU06

QU07~QU10 DTC144ES

QU07 SOURCE QU08 TAPE1 QU09 TAPE2 QU10 TAPE3

RU10 1.2k RU09 1.2k RU08 1.2k

DU03 DU02 DU01

DU01~DU03 LT3DBB RED

QU02 TC9130P

SENSOR AND SCHMIDT TRIGGOR GATE T TYPE FLIP-FLOP GATE

DIS-1 DIS-2 DIS-3 DIS-4

DITTO DITTO DITTO

BUFFER

CS

CU15 0.01 RU16 10k RU15 10k RU06 10k CU06 100p CU13 0.01 RU05 10k CU05 100p CU14 0.01 RU07 10k CU04 10/16V

SU06 MUTE SU05 SOURCE DIRECT

CU03 0.1 50V

RU13 1.2k RU12 1.2k

DU06 LT3DBB RED DU05 LT3DBB RED

QU11 DTC114TS

QU12 DTC114TS

DIRECT MUTE

JU01 WU01

JU02

From P801 (J807)

TOP VIEW

NJM2068-DD

TOP VIEW

TC9130P, TC9135P

DTC144ES DTA114ES DTC114TS

2SK369(BL)

From P851 (J851) W862 JS12 JS11

From P801 (J813) WS04 JS14

From P701 (J707) WS03 JS13

JS15 HEADPHONE JACK

CS23 0.01 CS24 0.01

+24V (+24V) AB

ON ON

SS02 CLASS A

SPEAKERS

To PZ01 (JZ02) WS05

From P801 (J806)

JS10 WS06

-15V N.C. +15V N.C. +24V DIR

DS01 MA165, etc. 24V

LS01 SOURCE DIRECT

To P701 (J703)

JS08 WS02

PS01 FRONT SW, SPK SW

BALANCE VOLUME PG51

JS07 WG03 JG03

JS03 WS01 JG51 JG52 WG51 JG01

RS01 220 RS02 220

JG02 WG01

JS09

RS04 2.2k RS03 2.2k RS31 1M

MC MM

:NONSHORT :SHORTING

IN ON

PHONO PS01 PROCESSOR MONO SS01

RG51 100k (MN) x2 BALANCE

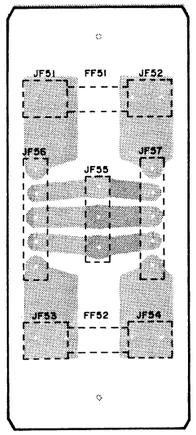
RG01 MASTER 25k(A) 50k(A)

PG01 MASTER VOLUME

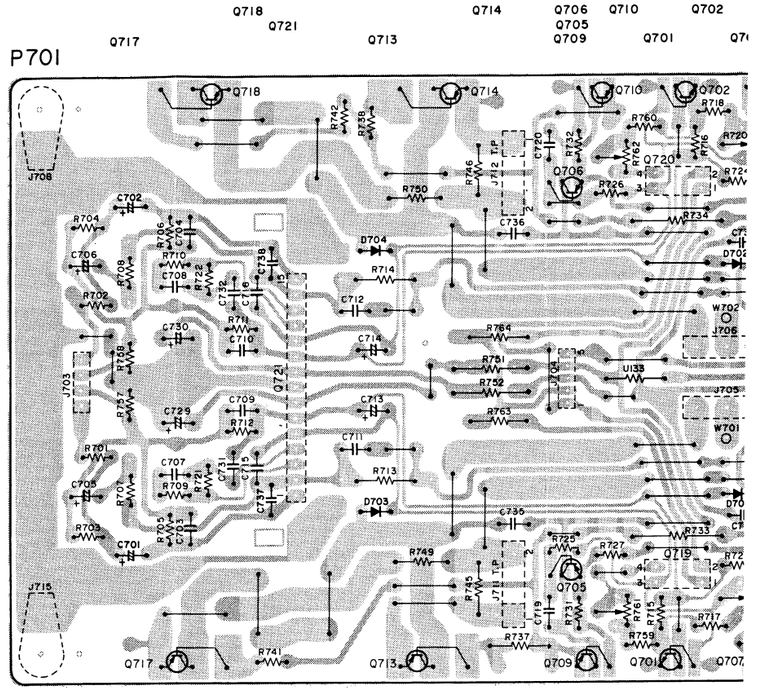
JS04 JS05 JS02

W401 W402 WV02

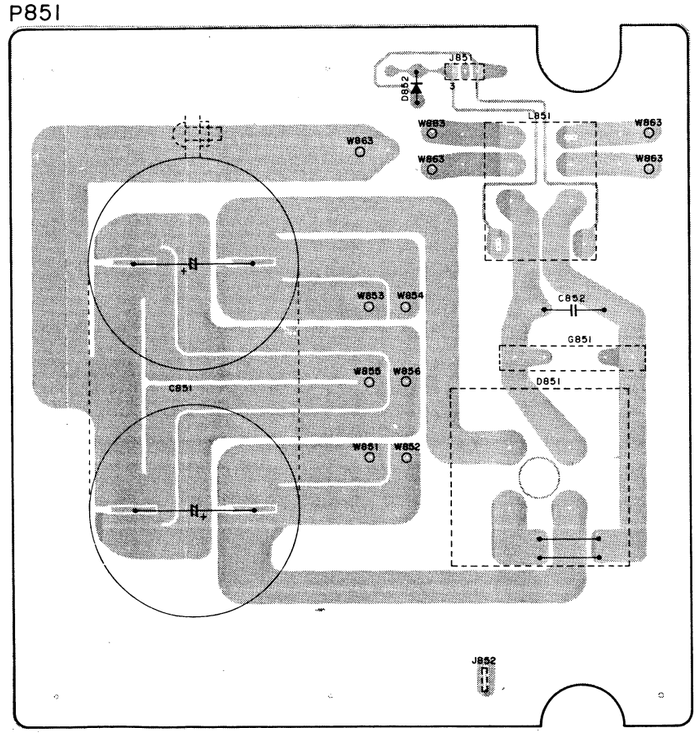
PF51



P701

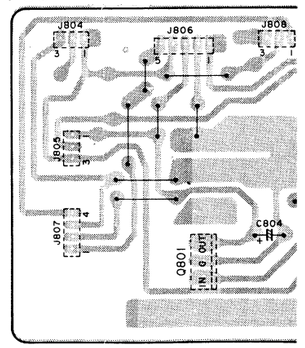


P851

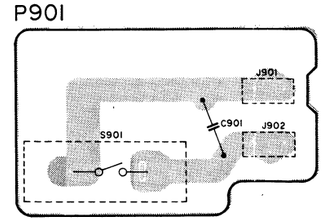


Q801

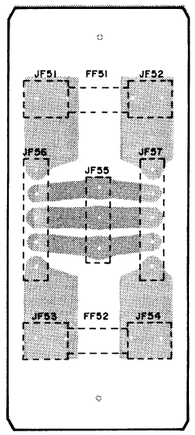
P801



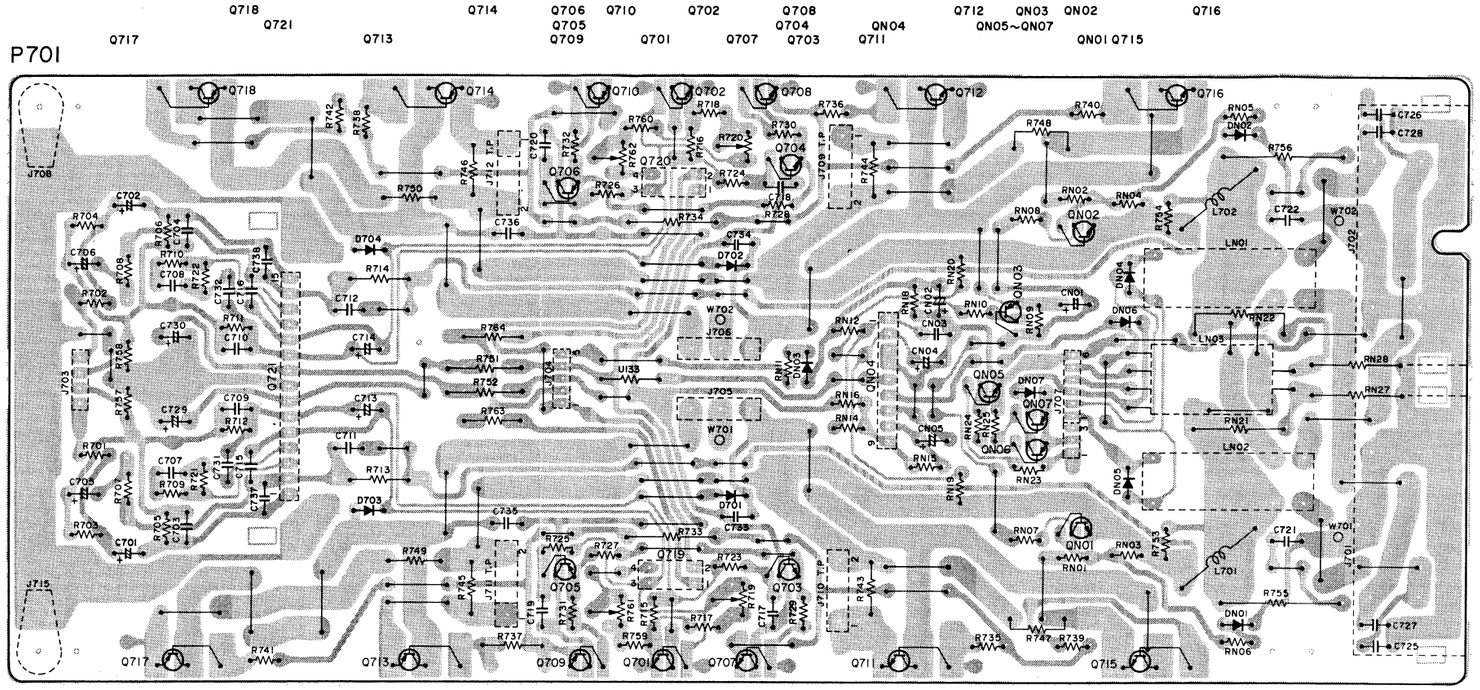
P901



PF51



P701



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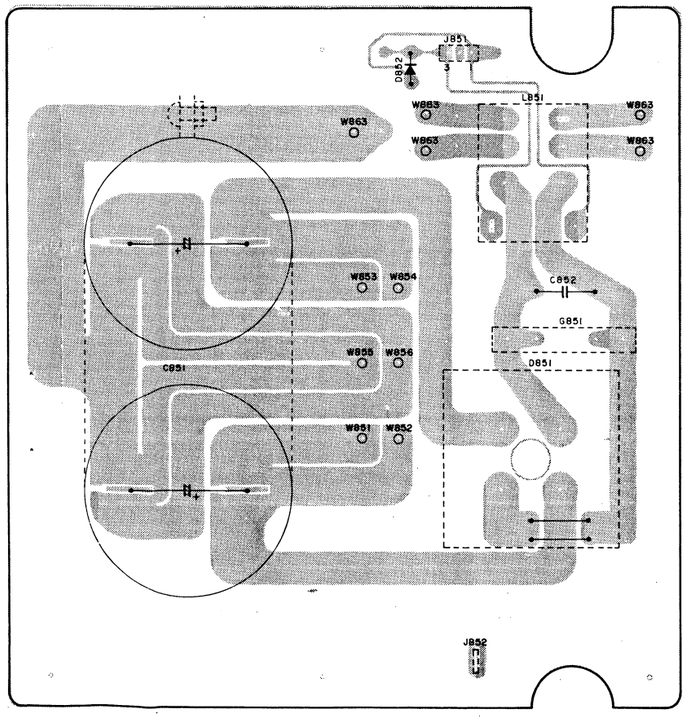
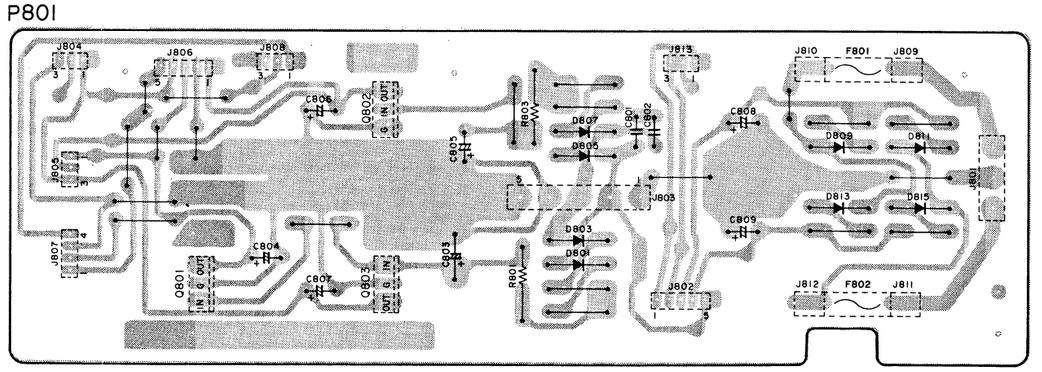


P801



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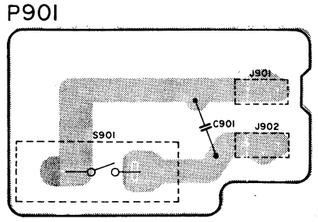
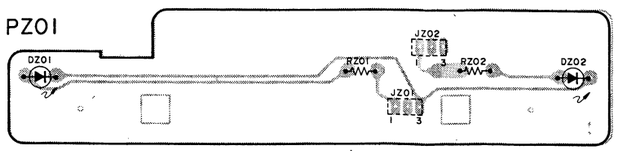
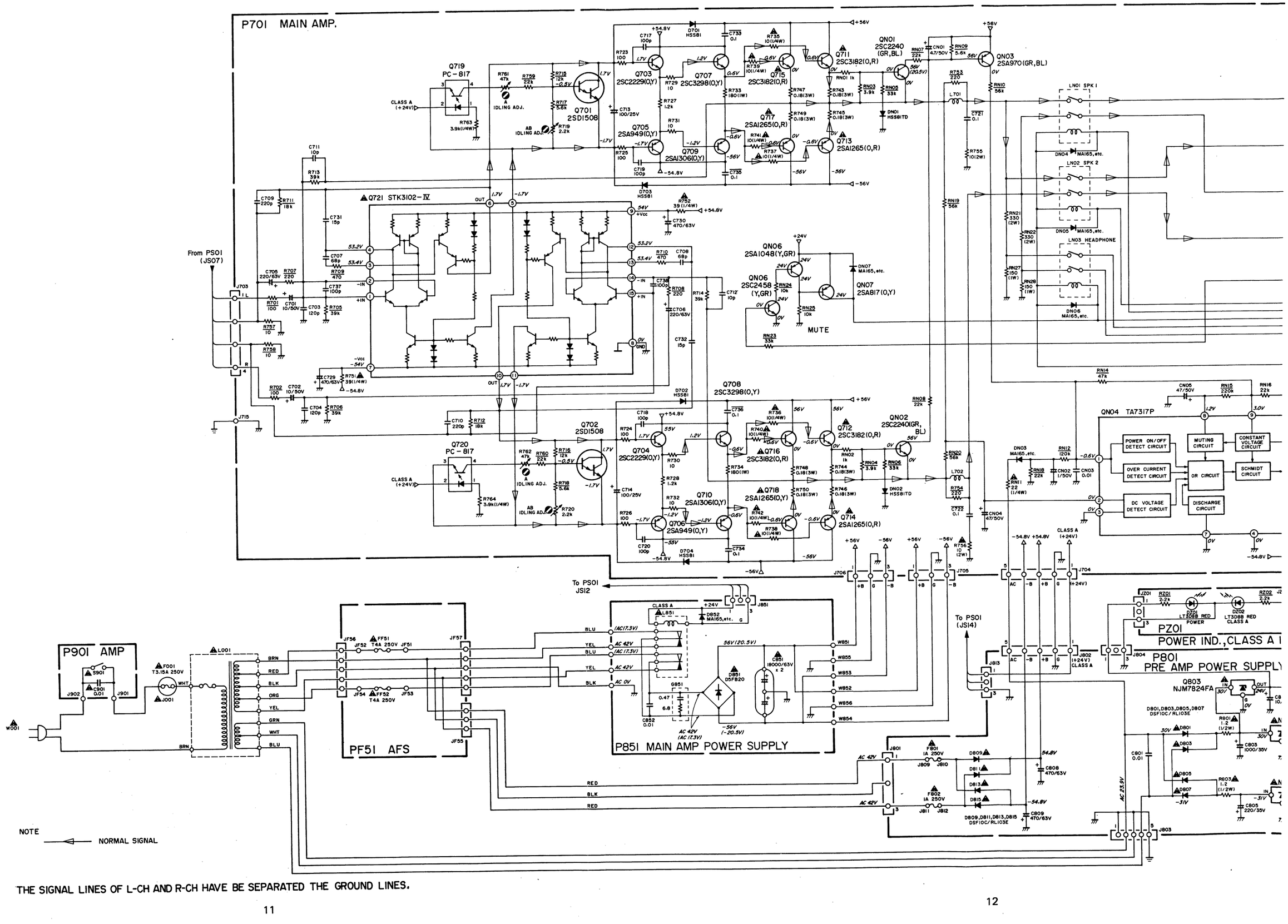


PZ01





THE SIGNAL LINES OF L-CH AND R-CH HAVE BE SEPARATED THE GROUND LINES.

P851 MAIN AMP POWER SUPPLY

P801 PRE AMP POWER SUPPLY

PZ01 POWER IND., CLASS A IND.

QN04 TA7317P

POWER ON/OFF DETECT CIRCUIT
OVER CURRENT DETECT CIRCUIT
DC VOLTAGE DETECT CIRCUIT
MUTING CIRCUIT
OR CIRCUIT
DISCHARGE CIRCUIT
CONSTANT VOLTAGE CIRCUIT
SCHMIDT CIRCUIT
RELAY DRIVE CIRCUIT
SUBSTRATE

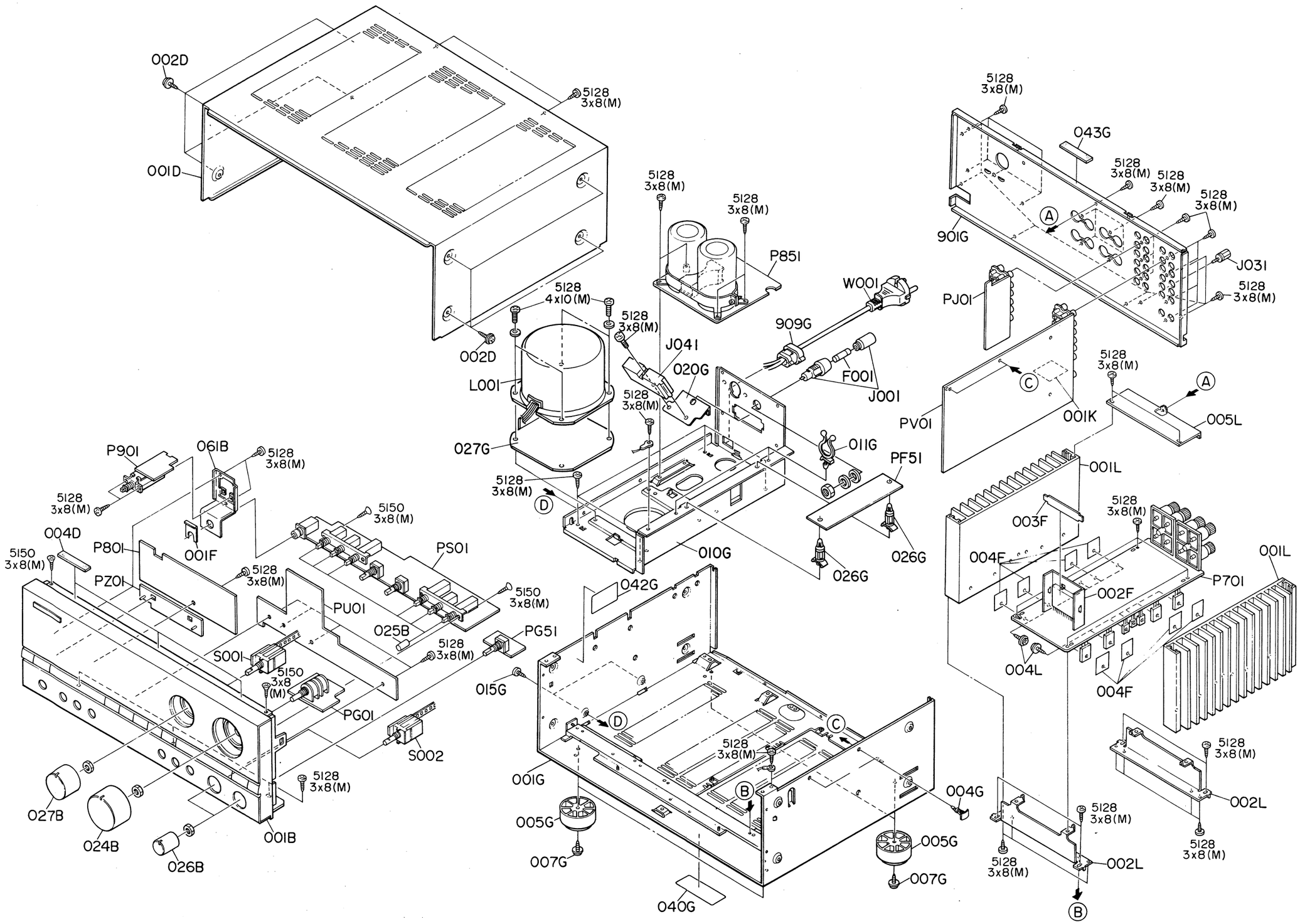
MUTE

SYSTEM 2

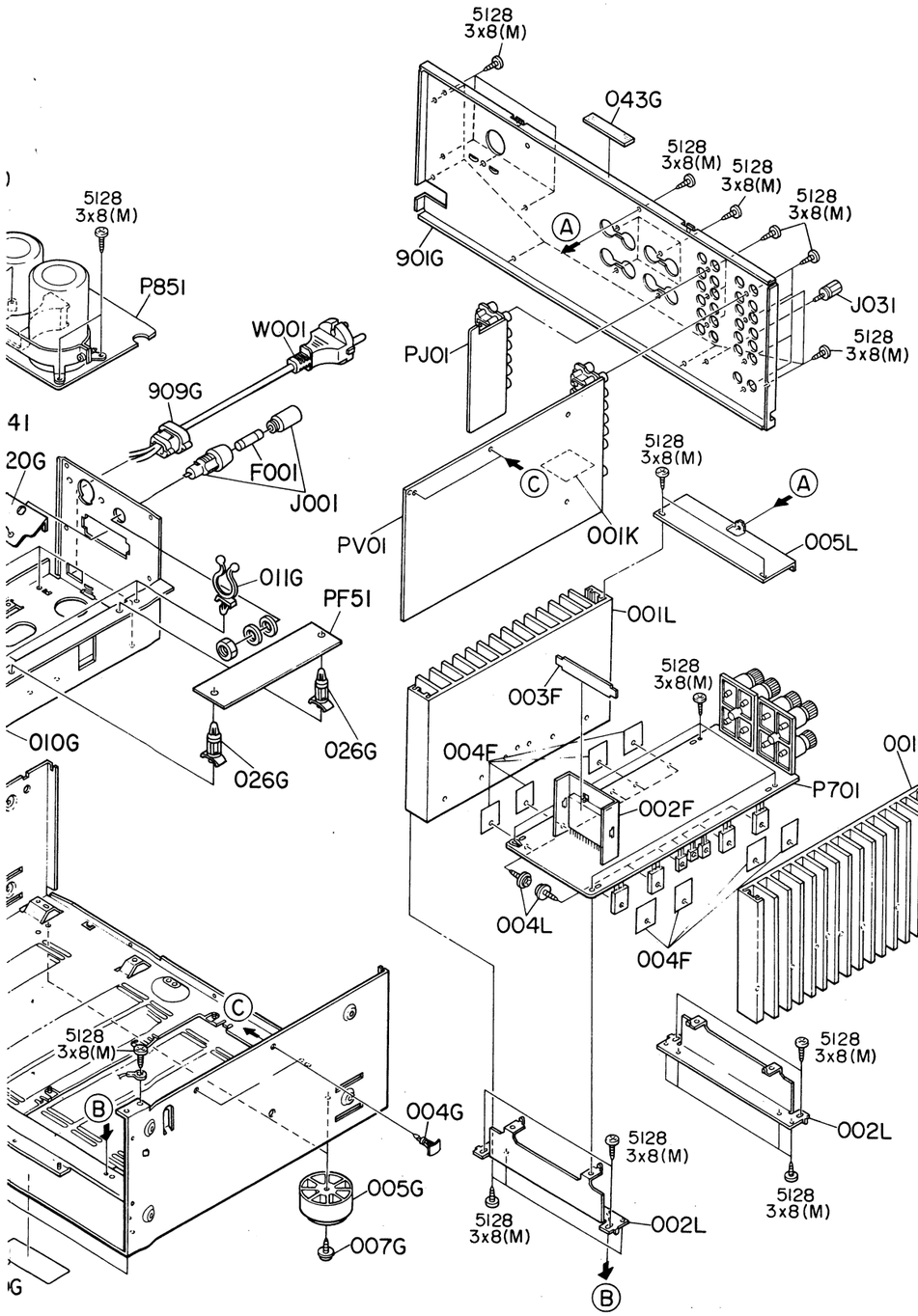
To PSO1 (JSI3)
To PSO1 (JSI2)
To PSO1 (JSI4)
To PSO1 (JSI1)
To PSO1 (JSI0)
To PU01 (JU01)
To PV01 (J402)

2SC536SP, etc.
2SA608SP, etc.
2SC2240(GR,BL)
2SA970(GR,BL)
STK3102-Ⅳ
2SC2229(0,Y)
2SA949(0,Y)
2SA817(0,Y)
TA7317P
2SC3298(0,Y)
2SA1306(0,Y)
2SD1508
NJM7824FA, NJM78MI5FA
NJM79MI5FA
2SC3182(0,R)
2SA1265(0,R)

3. EXPLODED VIEW AND PARTS LIST



REF. DESIG.	
001B	48
024B	48
025B	48
026B	48
027B	48
002D	48
004F	48
005G	48
909G	48
004L	48
⚠ F001	48
⚠ J001	48
⚠ L001	48
S001	48
S002	48
001T	48



REF. DESIG.	PART NO.	DESCRIPTION
001B	4822 425 20206	Front Panel Assembly
024B	4822 413 41701	Knob, Volume
025B	4822 410 61754	Button, Push
026B	4822 413 31551	Knob, Rec/Tone/Bal.
027B	4822 413 41702	Knob, Selector
002D	4822 501 11008	B.T. Screw (W/W) 4 x 8(M)
004F	4822 466 62033	Insulator, DENKA SHEET
005G	4822 462 41383	Leg
909G	4822 532 52145	Bushing, AC Cord
004L	4822 502 13851	B.T. Screw 3 x 15(M)
⚠ F001	4822 070 33152	Fuse 3.15A 250V
⚠ J001	4822 256 30223	Jack, Fuse Holder
⚠ L001	4822 146 21659	Power Transformer
S001	4822 273 10238	Rotary Switch, Input
S002	4822 273 10189	Rotary Switch, Recout
001T	4822 736 21337	User Manual

4. TEST EQUIPMENT REQUIRED FOR SERVICING

This table lists the test equipment required for servicing the Model PM-80 Stereo Amplifier.

Item	Use
Distortion Analyzer	Distortion measurements
Audio Oscillator	Sinewave and squarewave signal source
ACVTVM	Voltage measurements (AC)
Oscilloscope	Waveform analysis and trouble shooting and ASO aignment
Circuit Tester	Trouble shooting
DCVTVM	Voltage measurements (DC)
AC Wattmeter	Monitors primary power to amplifier
Line Voltmeter	Monitors potential of primary power to amplifier
Variable Autotransformer	Adjust level of primery power to amplifier
Shorting Plug	Shorts amplifier input to eliminate noise pickup

5. IDLING CURRENT ADJUSTMENT

(1) Before switching the power ON, set the Master Volume control to the minimum position and the Balance and Tone controls to the center positions. Then, rotate the semi-fixed resistors R719/R761 (L CH) and R720/R762 (R CH) on the PC board P701 fully counterclockwise.

(2) Connect a digital voltmeter, set for the DC voltage input, to the pertinent test points (the marked ones of P709-P712) on the PC board P701. (Positive: J709/J710, Negative: J711/J712)

(3) After the completion of the above setup, perform the class-AB idling current adjustment as follows:
Switch the power ON and adjust the semi-fixed resistors R719 (L CH) and R720 (R CH) on the PC board P701 according to the reading of the digital voltmeter. The setting values are 18 mV (50.0 mA) of the both channels.

(4) After the completion of the class-AB idling current adjustment, perform the class-A idling current adjustment as follows:
Press the Class-A switch and adjust the semi-fixed resistors R761 (L CH) and R762 (R CH) on the PC board P701 to set 198 mV (500 mA).

Note: For idling current adjustment, be sure to perform first class-AB, then class-A.

Please refer to the table below.

Elapsed time after power ON	Idling current setting value
30 sec. ~ 1 min.	17.5 mV
1 min. ~ 2 min.	19 mV
2 min. ~ 4 min.	19.5 mV
More than 4 min.	18 mV

Elapsed time after Class-A switch ON	Idling current setting value
30 sec. ~ 1 min.	205 mV
1 min. ~ 2 min.	205 mV
2 min. ~ 4 min.	200 mV
More than 4 min.	198 mV

Note on Safety:
Symbol ⚠ Fire or electrical shock hazard. Only original parts should be used to replace any part marked with symbol ⚠ . Any other component substitution (other than original type), may increase risk of fire or electrical shock hazard.

6. ELECTRICAL PARTS LIST

ASSIGNMENT OF COMMON PARTS CODES.

RESISTOR

R***: (1) GD05---140, Carbon film fixed resistor, ±5%, 1/4W
R***: (2) GD05---160, Carbon film fixed resistor, ±5%, 1/6W
① — Resistance value

Examples
① Resistance value

0.1Ω...001	10Ω...100	1kΩ...102	100kΩ...104
0.5Ω...005	18Ω...180	2.7kΩ...272	680kΩ...684
1Ω...010	100Ω...101	10kΩ...103	1MΩ...105
6.8Ω...068	390Ω...391	22kΩ...223	4.7MΩ...475

(Note) Please distinguish 1/4W from 1/6W by the shape of parts used actually.

C***: CERAMIC CAP.
(1) DD1---370, Ceramic condenser
①② Disc type
Temp. coeff. P350 ~ N1000, 50V
Capacity value
Tolerance

Examples
① Tolerance (Capacity deviation)
±0.25pF...0
±0.5pF...1
±5%...5
* Tolerance of COMMON PARTS handled here are as follows:
0.5pF ~ 5pF...±0.25pF
6pF ~ 10pF...±0.5pF
12pF ~ 560pF...±5%
② Capacity value

0.5pF...005	3pF...030	100pF...101
1pF...010	10pF...100	220pF...221
1.5pF...015	47pF...470	560pF...561

C***: CERAMIC CAP.
(1) DK16---300, High dielectric constant ceramic condenser
① Disc type
Temp. chara. 2B4, 50V
Capacity value

Example
② Capacity value

100pF...101	1000pF...102	10000pF...103
470pF...471	2200pF...222	

C***: ELECTROLY CAP. (⧧), FILM CAP. (⧦)
(1) EA------10, Electrolytic condenser
①② One-way lead type, Tolerance ±20%
Dielectric strength
Capacity value

Examples
① Capacity value

0.1μF...104	4.7μF...475	100μF...107
0.33μF...334	10μF...106	330μF...337
1μF...105	22μF...226	1100μF...108
		2200μF...228

② Working voltage

6.3V...006	25V...025
10V...010	35V...035
16V...016	50V...050

(2) DF15---350, Plastic film condenser
① One-way type, Mylar ±5% 50V
Capacity value

Examples
① Capacity value

0.001μF (1000pF)...102	0.1μF...104
0.0018μF.....182	0.56μF...564
0.01μF.....103	1μF...105
0.015μF.....153	

REF. DESIG.	PART NO.	DESCRIPTION
		PF51-CLASS A FUSE/ CONNECTOR CIRCUIT BOARD
▲ FF51	4822 253 30199	Fuse, 4A 250V
▲ FF52	4822 253 30199	Fuse, 4A 250V
		PG01-MASTER VOLUME CIRCUIT BOARD
PG01	4822 100 11859	Variable Resistor 4GANG
		PG51-BALANCE VOLUME CIRCUIT BOARD
RG51	4822 101 30652	Variable Resistor 100KΩ(MN)x2
		PJ01-TAPE MONITOR IN/OUT CIRCUIT BOARD
CJ01 ~ CJ06	4822 122 32486	Ceramic 0.01μF +80% −20%
JJ01	4822 267 20348	Terminal, 4P; RCA
JJ02	4822 267 20348	Terminal, 4P; RCA
JJ03	4822 267 20348	Terminal, 4P; RCA
		PS01-TONE AMP/FRONT/SPK. CIRCUIT BOARD
		PS01-CAPACITORS
CS23	4822 122 32486	Ceramic 0.01μF +80% −20% [N]
CS24	4822 122 32486	Ceramic 0.01μF +80% −20% [N]
		PS01-SEMICONDUCTORS
DS01	4822 130 33305	Diode 1SS176, etc.
		PS01-MISCELLANEOUS
JS15	4822 267 31274	Jack, Headphone
SS01	4822 276 30406	Push Switch
SS02	4822 276 30405	Push Switch
LS01	4822 280 20501	Relay MR62-24SR
		PU01-FUNCTION/ANA SWITCH CIRCUIT BOARD
		PU01-CAPACITORS
CU01	4822 124 21894	Elect 10μF 16V
CU03	4822 124 90351	Elect 0.1μF 50V
CU04	4822 124 90352	Elect 10μF 16V
CU07 ~ CU10	4822 122 33639	Ceramic 1000pF ±10%
CU13 ~ CU15	4822 122 32486	Ceramic 0.01μF +80% −20%
		PU01-SEMICONDUCTORS
DU01 ~ DU06	4822 130 80326	L.E.D. LT3D8B RED 30
QU01	4822 209 71781	IC TC9135P
QU02	4822 209 70069	IC TC9130P
QU03 ~ QU06	4822 130 61227	Transistor DTA114ES, Digital
QU07 ~ QU10	4822 130 42594	Transistor DTC144ES, Digital

REF. DESIG.	PART NO.	DESCRIPTION
QU11	4822 130 61189	Transistor DTC114TS, Digital
QU12	4822 130 61189	Transistor DTC114TS, Digital
		PU01-MISCELLANEOUS
SU01 ≀ SU06	4822 276 20508	Push Switch, Tact
		PV01-PHONO AMP/INPUT SELECTOR CIRCUIT BOARD
		PV01-CAPACITORS
CV01 ≀ CV10	4822 122 32486	Ceramic 0.01μF +80% −20%
C401	4822 122 32486	Ceramic 0.01μF +80% −20%
C402	4822 122 32486	Ceramic 0.01μF +80% −20%
C405	4822 121 43759	Film 1000pF ±5%
C406	4822 121 43759	Film 1000pF ±5%
C407	4822 124 22694	Elect 1000μF 6.3V
C408	4822 124 22694	Elect 1000μF 6.3V
C409	4822 124 90353	Elect 100μF 10V
C410	4822 124 90353	Elect 100μF 10V
C411	4822 121 42764	Film 0.047μF ±5%
C412	4822 121 42764	Film 0.047μF ±5%
C413	4822 121 42755	Film 0.012μF ±5%
C414	4822 121 42755	Film 0.012μF ±5%
C415	4822 121 42758	Film 1800pF ±5%
C416	4822 121 42758	Film 1800pF ±5%
C417	4822 124 90358	Elect 22μF 16V
C418	4822 124 90358	Elect 22μF 16V
C419	4822 121 42763	Film 3900pF ±5%
C420	4822 121 42763	Film 3900pF ±5%
C421	4822 124 90365	Elect 220μF 25V
C422	4822 124 90365	Elect 220μF 25V
		PV01-RESISTORS
R405	4822 116 53691	4.64KΩ ±1% 1/6W
R406	4822 116 53691	4.64KΩ ±1% 1/6W
R407	4822 116 53691	4.64KΩ ±1% 1/6W
R408	4822 116 53691	4.64KΩ ±1% 1/6W
R419	4822 116 53691	4.64KΩ ±1% 1/6W
R420	4822 116 53691	4.64KΩ ±1% 1/6W
▲ R425	4822 113 90119	22Ω ±2% ¼W, Fuse
▲ R426	4822 113 90119	22Ω ±2% ¼W, Fuse
		PV01-SEMICONDUCTORS
DV01 ≀ DV05	4822 130 33305	Diode MA165, etc.
Q401	4822 130 42839	F.E.T. 2SK369(BL)
Q402	4822 130 42839	F.E.T. 2SK369(BL)
Q403	4822 130 42839	F.E.T. 2SK369(BL)
Q404	4822 130 42839	F.E.T. 2SK369(BL)
Q405	4822 209 73064	IC NJM2068DD
		PV01-MISCELLANEOUS
JV01	4822 266 30282	Terminal, 2P; RCA
JV02	4822 266 30357	Terminal, 6P; RCA
JV03	4822 266 20348	Terminal, 4P; RCA
J401	4822 266 30283	Terminal, 2P; RCA
LV01 ≀ LV05	4822 280 20195	Relay, SZ-2104
L401	4822 156 11019	Choke Coil 320mH [N]
L402	4822 156 11019	Choke Coil 320mH [N]
SV01	4822 277 20832	Slide Switch, Input
SV02	4822 277 21352	Slide Switch, Recout

REF. DESIG.	PART NO.	DESCRIPTION
		PZ01-POWER/CLASS A INDICATOR CIRCUIT BOARD
DZ01	4822 130 80326	L.E.D. LT3D8B RED 30
DZ02	4822 130 80326	L.E.D. LT3D8B RED 30
		P701-MAIN AMP CIRCUIT BOARD
		P701-CAPACITORS
CN01	4822 124 22274	Elect 4.7μF 50V
CN02	4822 124 41543	Elect 1μF 50V
CN03	4822 121 42754	Film 0.01μF ±5%
CN04	4822 124 22276	Elect 47μF 50V
CN05	4822 124 22276	Elect 47μF 50V
C701	4822 124 23082	Elect 10μF 50V
C702	4822 124 23082	Elect 10μF 50V
C703	4822 121 43126	Film 120pF ±5%
C704	4822 121 43126	Film 120pF ±5%
C705	4822 124 23068	Elect 220μF 63V
C706	4822 124 23068	Elect 220μF 63V
C707	DF56680091	Film 68pF ±10%
C708	DF56680091	Film 68pF ±10%
C709	4822 121 51038	Film 220pF ±5%
C710	4822 121 51038	Film 220pF ±5%
C711	4822 121 43128	Film 10pF ±10%
C712	4822 121 43128	Film 10pF ±10%
C713	4822 124 41535	Elect 100μF 25V
C714	4822 124 41535	Elect 100μF 25V
C717	4822 121 51036	Film 100pF ±5%
C718	4822 121 51036	Film 100pF ±5%
C719	4822 121 51036	Film 100pF ±5%
C720	4822 121 51036	Film 100pF ±5%
C725	4822 122 32486	Ceramic 0.01μF +80% −20% [N]
C726	4822 122 32486	Ceramic 0.01μF +80% −20% [N]
C727	4822 122 32486	Ceramic 0.01μF +80% −20% [N]
C728	4822 122 32486	Ceramic 0.01μF +80% −20% [N]
C729	4822 124 23071	Elect 470μF 63V
C730	4822 124 23071	Elect 470μF 63V
C731	4822 121 43129	Film 15pF ±10%
C732	4822 121 43129	Film 15pF ±10%
C737	4822 126 10364	Ceramic 100pF ±10%
C738	4822 126 10364	Ceramic 100pF ±10%
		P701-RESISTORS
RN01	4822 111 91257	1KΩ ±5% 1/6W
RN02	4822 111 91257	1KΩ ±5% 1/6W
▲ RN11	4822 113 90119	22Ω ±2% ¼W, Fuse
RN16	4822 050 12203	22KΩ ±5% 1/6W
RN21	4822 116 60494	330Ω ±5% 2W, Metal
RN22	4822 116 60494	330Ω ±5% 2W, Metal
RN27	4822 116 60337	150Ω ±5% 1W
RN28	4822 116 60337	150Ω ±5% 1W
R713	4822 053 10393	39KΩ ±5% 1W
R714	4822 053 10393	39KΩ ±5% 1W
R719	4822 100 20681	2.2KΩ, Trimming
R720	4822 100 20681	2.2KΩ, Trimming
R723	4822 111 91285	100Ω ±5% 1/6W
R724	4822 111 91285	100Ω ±5% 1/6W
R725	4822 111 91285	100Ω ±5% 1/6W
R726	4822 111 91285	100Ω ±5% 1/6W
R727	4822 111 91287	1.2KΩ ±5% 1/6W
R728	4822 111 91287	1.2KΩ ±5% 1/6W
R729	4822 111 91291	10Ω ±5% 1/6W
R730	4822 111 91291	10Ω ±5% 1/6W
R731	4822 111 91291	10Ω ±5% 1/6W
R732	4822 111 91291	10Ω ±5% 1/6W
R733	4822 116 60342	180Ω ±5% 1W
R734	4822 116 60342	180Ω ±5% 1W

REF. DESIG.	PART NO.	DESCRIPTION
▲R735 ~ ▲R742	4822 111 41271	10Ω ±5% ¼W
R743 ~ R750	4822 116 80171	0.18Ω ±10% 3W
▲R751	4822 116 52855	39Ω ±5% ¼W
▲R752	4822 116 52855	39Ω ±5% ¼W
R755	4822 111 90726	10Ω ±5% 2W
▲R756	4822 111 90726	10Ω ±5% 2W
R761	4822 100 11372	47KΩ, Trimming
R762	4822 100 11372	47KΩ, Trimming
R763	4822 111 91249	3.9KΩ ±5% ¼W
R764	4822 111 91249	3.9KΩ ±5% ¼W
U133	4822 050 21003	10KΩ ±5% ½W
		P701-SEMICONDUCTORS
DN01	4822 130 80837	Diode HSS81TD
DN02	4822 130 80837	Diode HSS81TD
DN03 ~ DN07	4822 130 33305	Diode MA165, etc.
D701 ~ D704	4822 130 80837	Diode HSS81TD
QN01	4822 130 43233	Transistor 2SC2240(GR, BL)
QN02	4822 130 43233	Transistor 2SC2240(GR, BL)
QN03	4822 130 42951	Transistor 2SA970(GR, BL)
QN04	4822 209 83312	IC TA7317P
QN05	4822 130 60839	Transistor 2SC2458(Y, GR)
QN06	4822 130 60107	Transistor 2SA1048(Y, GR)
QN07	4822 130 60693	Transistor 2SA817(O, Y)
Q701	4822 130 60526	Transistor 2SD1508
Q702	4822 130 60526	Transistor 2SD1508
Q703	4822 130 43225	Transistor 2SC2229(O, Y)
Q704	4822 130 43225	Transistor 2SC2229(O, Y)
Q705	4822 130 42941	Transistor 2SA949(O, Y)
Q706	4822 130 42941	Transistor 2SA949(O, Y)
Q707	4822 130 61362	Transistor 2SC3298(O, Y)
Q708	4822 130 61362	Transistor 2SC3298(O, Y)
Q709	4822 130 60524	Transistor 2SA1306(O, Y)
Q710	4822 130 60524	Transistor 2SA1306(O, Y)
▲Q711	4822 130 43306	Transistor 2SC3182(O, R)
▲Q712	4822 130 43306	Transistor 2SC3182(O, R)
▲Q713	4822 130 43019	Transistor 2SA1265(O, R)
▲Q714	4822 130 43019	Transistor 2SA1265(O, R)
▲Q715	4822 130 43306	Transistor 2SC3182(O, R)
▲Q716	4822 130 43306	Transistor 2SC3182(O, R)
▲Q717	4822 130 43019	Transistor 2SA1265(O, R)
▲Q718	4822 130 43019	Transistor 2SA1265(O, R)
Q719	4822 130 90347	Photo Unit PC-817
Q720	4822 130 90347	Photo Unit PC-817
Q721	4822 209 73453	IC STK3102-4
		P701-MISCELLANEOUS
J701	4822 290 61072	Terminal, Speaker
J702	4822 290 61071	Terminal, Speaker
LN01	4822 280 70354	Relay VB24MBU-UL
LN02	4822 280 70354	Relay VB24MBU-UL
LN03	4822 280 20196	Relay L-24(M)
L701	4822 157 63817	Coil, Speaker
L702	4822 157 63817	Coil, Speaker

REF. DESIG.	PART NO.	DESCRIPTION
		P801-PRE AMP POWER SUPPLY CIRCUIT BOARD
		P801-CAPACITORS
C801	4822 122 32486	Ceramic 0.01μF +80% −20%
C803	4822 124 90356	Elect 1000μF 35V
C804	4822 124 41534	Elect 10μF 25V
C805	4822 124 41538	Elect 220μF 35V
C806	4822 124 41534	Elect 10μF 25V
C807	4822 124 41534	Elect 10μF 25V
C808	4822 124 23071	Elect 470μF 63V
C809	4822 124 23071	Elect 470μF 63V
		P801-RESISTORS
▲R801	4822 116 82032	1.2Ω ±5% ½W
▲R803	4822 116 82032	1.2Ω ±5% ½W
		P801-SEMICONDUCTORS
▲D801	4822 130 32508	Diode DSF10C/RL103E
▲D803	4822 130 32503	Diode DSF10C/RL103E
▲D805	4822 130 32508	Diode DSF10C/RL103E
▲D807	4822 130 32508	Diode DSF10C/RL103E
▲D809	4822 130 32508	Diode DSF10C/RL103E
▲D811	4822 130 32508	Diode DSF10C/RL103E
▲D813	4822 130 32508	Diode DSF10C/RL103E
▲D815	4822 130 32508	Diode DSF10C/RL103E
▲Q801	4822 209 82829	IC NJM78M15FA
▲Q802	4822 209 61526	IC NJM79M15FA
▲Q803	4822 209 30441	IC NJM7824FA
		P801-MISCELLANEOUS
▲F801	4822 070 31002	Fuse 1A 250V
▲F802	4822 070 31002	Fuse 1A 250V
		P851-MAIN AMP POWER SUPPLY CIRCUIT BOARD
▲C851	4822 124 23067	Elect Cap. 18000μF/63V x 2
C852	4822 122 40545	Ceramic Cap. 0.01μF ±10%
▲D851	4822 130 33132	Diode D5FB20
D852	4822 130 33305	Diode MA165, etc.
L851	4822 280 20403	Relay MC24D2-O
		P901-POWER SWITCH CIRCUIT BOARD
▲C901	4822 122 33276	Ceramic Cap. 0.01μF ±20%
▲S901	4822 276 12647	Push Switch, Power

NOTE ON SAFETY:
Symbol ▲ Fire or electrical shock hazard. Only original parts should be uned to replace any part marked with symbol ▲. Any other component substitution (other than original type), mayincrease risk of fire or electrical shock hazard.